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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/728,490

12/05/2003

Mark T. Anderson

58623US002

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09/22/2008

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EXAMINER

CHACKO DAVIS, DABORAH

ART UNIT

PAPER NUMBER

1795

NOTIFICATION DATE

DELIVERY MODE

09/22/2008

ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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<b>Office Action Summary</b>	<b>Application No.</b> 10/728,490	<b>Applicant(s)</b> ANDERSON ET AL.	
	<b>Examiner</b> DABORAH CHACKO DAVIS	<b>Art Unit</b> 1795	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 27 August 2008.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-6 and 8-38 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-6 and 8-38 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1-6, 8-27, and 36-38, are rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent No. 2004/0012872 (Fleming et al., hereinafter referred to as Fleming).

Fleming, in the abstract, in [0019], [0020], [0021], [0022], [0027], [0060], [0076], [0188], discloses a method of providing a photoreactive composition that is substantially inorganic, exposing the photoreactive composition to a multibeam exposure process (multi beam of at least four beams, and multiphoton reactive radiation, pulsed IR laser) so as to form reacted and non-reacted portions of the photoreactive composition to form a three-dimensional pattern (of exposed and unexposed areas), developing the photoreactive composition (remove reacted portions or non-reacted portions, remove exposed or unexposed areas with a solvent or chemical etching) to form a periodic pattern (interstitial void space of submicron dimensions). Fleming, in [0074], [0080], and [0082], discloses that the photoreactive composition can include silicone resin containing epoxy functionality and that epoxy-functional polymers include epoxy

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functional silicones i.e., a substantially inorganic composition (claims 1-3, 8, 23-27, 36, and 38). Fleming, in [0179], discloses that the photoreactive composition is further subjected to heating, causing the facilitation of dissolution of certain components and the dissipation of volatile components and therefore losses less than 60 percent of the its initial weight (upon irradiation and heating) (claims 5, and 37). Fleming, in [0028], and [0074], discloses that the photoreactive composition includes reactive species such as curable organic species, a photoinitiator, and inorganic particles such as siloxanes (claims 4, 6). Fleming, in [0028], [0108], [0124], [0134], discloses a photoinitiator that includes a multiphoton photosensitizer, electron donors such as amines, and electron acceptors such as iodonium salts or triazines (claims 9-10, and 15-16). Fleming, in [0099], discloses that the photon absorption of the multi-photon photosensitizer is greater than that of the fluorescein (claim 11-12). Fleming, in [0110], discloses that the multi-photon photosensitizer (with a large multi-photon absorption cross-section) in the photoreactive composition is Rhodamine B (claims 13-14). Fleming, in [0134], discloses that the photoreactive composition includes metal fluorides (metal complexes such as oxides) that are later irradiated during exposure (claims 17-22).

### ***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 28-35, are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 2004/0012872 (Fleming et al., hereinafter referred to as Fleming) in view of U. S. Patent No. 4,406,992 (Kurtz et al., hereinafter referred to as Kurtz).

Fleming is discussed in paragraph no. 2.

Fleming, in [0021], [0022], [0027], [0060], [0076], [0188], discloses removing reacted or unreacted (or both) portions of the photoreactive composition after exposure processes by developing or etching (claims 30-31).

The difference between the claims and Fleming is that Fleming does not disclose that the three-dimensional structures (interstitial voids) formed are deposited with a semiconductor material as recited in claims 28, 29, 32-35).

Kurtz, in col 3, lines 55-67, and in col 4, lines 29-32, discloses that the grating structure is filled with a semiconducting material such as silicon, wherein the grating has a refractive index that is different than that of the semiconductor (material filling the grating or interstitial voids).

Therefore, it would be obvious to a skilled artisan to modify Fleming by employing the method of depositing the claimed material on the gratings as suggested by Kurtz, because Fleming, in [0002], discloses that the three-dimensional patterns (gratings) are formed using the multi-photon method, and Kurtz, in col 5, lines 59-64, in col 6, lines 1-3, discloses that using the semiconductor material to fill the grating enables the production of a semiconductor device (transducer) that is capable of high temperature operation.

### ***Response to Arguments***

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5. Applicant's arguments, see Remarks, filed August 27, 2008, with respect to the rejection(s) of claim(s) 28-35, under 35 U. S. C. 103(a)) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection (35 U. S. C. 103(a) rejection) is made in view of Kurtz. See paragraph no. 4.

6. Applicant's arguments filed August 27, 2008, with respect to claims 1-6, 8-27, and 36-38, have been fully considered, but they are not persuasive. The 102 rejection made in the previous office action (paper no. 20080808) has been maintained.

7. Examiner acknowledges the applicant's request for an interview. However, upon receipt of the present office action i.e., paper no. 20080913, the examiner requests that the applicants contact the examiner, at the phone number provided in the conclusion paragraph below, so as to schedule an interview in advance, and prior to filing a response to the present office action.

A) Applicants argue that Fleming does not teach a substantially inorganic photoreactive composition, and that Fleming does not describe the use of epoxy functional silicones.

Fleming, in [0080], and [0082], discloses that the photoreactive composition can be an epoxy functional silicone i.e., the photoreactive composition is substantially inorganic. Fleming in paragraph nos. [0080], [0081], [0082], discloses that the

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composition includes silicone resin that has epoxy functionality and therefore has both organic and inorganic components.

B) Applicants argue that both Fleming and Borelli do not describe the deposition of a semiconductor.

Fleming is not relied upon to disclose the deposition of a semiconductor material. Fleming in [0002], teaches the use of the polymeric composition to manufacture three-dimensional structures. Kurtz is relied upon to disclose the use of a three-dimensional structure such as gratings to deposit a semiconductor material such as silicon. See paragraph no. 4.

### ***Conclusion***

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daborah Chacko-Davis whose telephone number is (571) 272-1380. The examiner can normally be reached on M-F 9:30 - 6:00. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark F Huff can be reached on (571) 272-1385. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you

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have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

dcd

/Daborah Chacko-Davis/  
Examiner, Art Unit 1795

September 15, 2008.